

estimates that it will require a minimum of 200-300 MHz of feeder link spectrum in the C-Band (in each direction.) More spectrum would be required in the Ka-Band.

After reviewing the alternatives, Ellipsat believes that reverse band operation in the fixed satellite bands below 15 GHz offers the best option for obtaining adequate LEO feeder link spectrum. The use of the reverse band mode in a variety of fixed satellite bands will potentially open up a large number of frequency bands for LEO feeder links without interference to existing operations. This will also provide the most expeditious strategy for obtaining adequate feeder link spectrum. In this proceeding, the Commission should adopt appropriate rule changes to permit reverse band operations.

The ITU working groups have concluded that reverse band working is feasible and will not cause harmful interference to FSS operations.^{21/} On the basis of these and similar findings, Ellipsat urges the Commission to move forward to make FSS frequencies available for LEO feeder links through appropriate rule provisions authorizing the reverse band mode.^{22/} The FCC should also propose and support co-primary allocations for MSS feeder links at WRC-95 in a variety of FSS bands below 15 GHz.

^{21/} See Document 4-5/TEMP/22-E, 9 June 1994, attached as Exhibit B hereto and Loral Technical Appendix, Section 3.

^{22/} See Loral Comments at 93-94.

In addition, the Commission should allocate spectrum in the C-Band for LEO feeder links. Ellipsat agrees with Loral that suitable candidate spectrum is 6425 to 7075 (downlinks); 5000 to 5250 MHz (uplinks).

V. A MAJORITY SUPPORTS GLOBAL AND U.S. COVERAGE REQUIREMENTS

All of the LEO applicants support the Commission's proposal to adopt minimum global and U.S. coverage requirements for the MSS Above 1 GHz Service. The parties agree that global coverage is a desirable objective and that the LEOs' ability to provide global service will foster substantial public interest benefits, in the U.S. and worldwide. Similarly, there is broad support for a U.S. coverage requirement.

If coverage requirements are adopted, the comments strongly recommend that these requirements be more carefully tailored to meet the Commission's objective of service to populated areas. While various benchmarks have been proposed, the critical factor is that the area between that 55° southern latitude (i.e., southern tip of South America) and 75° northern latitude (i.e., northern tip of Alaska) would encompass any region where there is likely to be a demand for service.

Ellipsat also recommends that, if the Commission adopts an elevation angle approach, the standard should encompass a minimum satisfactory quality of service. The ELLIPSO™ system foresees a 15°

elevation angle standard for global coverage and a 25° elevation angle standard for U.S. coverage.

The Commission should reject Motorola's request to expand the global coverage standard to include a requirement that the licensee will establish ground segment infrastructure necessary to provide service to countries representing a minimum percentage of the population and surface of the globe within six years of grant. This proposal represents a blatant attempt by Motorola to handicap systems using gateways and ground-based switching, and represents an unwarranted intrusion into the licensees' business and technical strategy. Its primary objective is to mandate a specific market and technical approach and to deny to other systems cost-efficiencies which Motorola has failed to introduce into its own. This proposal (which Motorola also offers as an additional milestone criterion) should be rejected by the Commission in all of its guises.

VI. THE INTER-SERVICE SHARING
RULES ARE UNDULY RESTRICTIVE

As a general principle, Ellipsat shares the view expressed by other parties in this proceeding that the inter-service protection criteria are overly restrictive. In a number of instances, the proposed rules go beyond the international regulations.

A. Radio Astronomy Service

The out-of-band emission limits proposed in Rule 25.213(a)(2) are too rigid and fail to take into account the intermittent nature of any potential interference from LEO systems. Ellipsat shares the views expressed by other commenting parties that (1) the general obligation in the international radio regulations of protecting RAS observations from harmful interference is worth adopting;^{23/} (2) coordination of RAS observations should be required during periods of non-peak traffic periods for MSS systems; (3) a beacon-activated protection zone may be used in lieu of fixed protection zones without requiring a coordination agreement with the EMSU as is now proposed; and (4) the FCC should not expand the RAS interference protection to additional sites without an opportunity for comment.^{24/}

B. Terrestrial Fixed Services in the S-Band

International radio regulation 2566 establishes a threshold downlink power flux density level above which MSS systems must coordinate with the Fixed Service. As the comments indicate, studies are now being undertaken to establish a more appropriate trigger PFD level. Ellipsat

^{23/} See Motorola Comments at 54-55.

^{24/} See TRW Comments at 121-23.

agrees with the comments of other parties that (1) a modest relaxation of the PFD limits is appropriate for purposes of sharing with terrestrial services;^{25/} (2) the PFD values should be treated as a coordination trigger not an absolute limit.^{26/}

C. Instructional Television Fixed Service

Based on the technical analyses and tests of the various parties, and the work of the negotiated rulemaking committee, it appears that ITFS stations could cause unacceptable interference into the primary MSS downlink allocation. To alleviate this problem, Ellipsat would apply the new out-of-band emission constraint to all ITFS stations immediately and allow a transition period to conform to new requirements.^{27/}

^{25/} In its comments, Ellipsat proposed that the PFD limit be modified to $-139 \text{ dBw/4 KHz/m}^2$.

^{26/} See Loral Comments at 73-78.

^{27/} See TRW Comments at 132.

VII. THE OPENING COMMENTS SUPPORT
A MORE REALISTIC FINANCIAL STANDARD

A. Domsat Standard Is Inappropriate For
A New And Commercially Unproven Service

The opening comments filed by other parties largely share Ellipsat's view that the strict financial test used in the domestic fixed satellite service is inappropriate for the Big LEOs which are a new and commercially unproven service. As discussed in Ellipsat's comments and others in this proceeding, the Commission has historically tailored the domsat standard to fit the specific satellite service involved, the maturity of the technology and the certainty of the prospective market.^{28/} In addition, as Ellipsat and others pointed out in the opening comments, the domsat standard is inappropriate where, as here, all of the LEO applicants can be accommodated.^{29/} Commission precedent requires a flexible application of the domsat standard in the context of the Big LEOS.

As discussed in great detail in Ellipsat's comments, the use of the domsat standard unfairly penalizes systems, like ELLIPSO™, that utilize innovative market strategies. The ELLIPSO™ system can be progressively deployed to meet market demand. This progressive deployment strategy has been endorsed by Barclays Bank, ELLIPSO™'s financial advisor, as an eminently reasonable

^{28/} See Ellipsat Comments at 34-39.

^{29/} See, e.g., TRW Comments at 41.

strategy. Indeed, the affidavit of Davinder Sethi, Senior Advisor to Barclays, and the letter from Trevor Nash, Director of Barclays, both of which were appended to Ellipsat's opening comments, declare that progressive deployment is the only sensible strategy for a new and commercially unproven service.^{30/}

The Commission should provide maximum flexibility to the LEO applicants to structure their systems in the manner they deem most advantageous from a market and financial standpoint.^{31/}

The Commission must, in any event, reject Motorola's attempt to graft an entirely new test onto the domsat standard. Motorola would measure the first year of operations for "the entire constellation for one year after all the satellites composing the full constellation are launched."^{32/} This approach is inconsistent with the Notice's proposal (and long-standing Commission precedent) to measure the first year of operations from the launch of the first satellite in the constellation. Moreover, Motorola's formulation would penalize innovative

^{30/} See Ellipsat Comments at Exhibit A. See also Comments of Westinghouse Electric Corporation; Comments of Harris Corporation. These strategic partners of the ELLIPSO™ system endorsed the system's market-driven strategy.

³¹ While the Comments correctly point out that the Commission has authority to establish threshold eligibility criteria, including financial qualifications, it is axiomatic that the FCC may not use financial requirements to winnow the applicant field or to "eradicate nonconformity under the pretext of assessing financial qualifications." ARINC v. FCC, 928 F.2d 428, 448 (D.C. Cir. 1991).

³² See Comments of Motorola Satellite Communications, Inc., CC Docket No. 92-166 (May 5, 1994), at 26.

approaches, like Ellipsat's progressive deployment strategy, which allows it to provide a commercial service with less than a full complement of satellites. The Commission's proposed milestone schedule allows a system to be implemented over a 6-year period. It makes no sense to require full funding to operate the complete system even before a license is granted. This is an artificial test without any relation whatsoever to actual service or to system viability.

B. The Opening Comments Support Adoption
Of The NVNG-MSS Financial Standard

The comments of other parties support Ellipsat's view that, if the domsat standard is adopted, the standard should be applied only to the portion of the system needed to introduce commercial service. This financial showing was previously used in the NVNG MSS proceeding and is appropriate here. As TRW correctly points out, "the many similarities between the NVNG MSS Service and the MSS above 1 GHz service merit a closer alliance of financial standards."^{33/}

In the analogous Little LEO proceeding, the Commission permitted financial qualifications to be demonstrated on the basis of ability to construct, launch and operate the minimum portion of the applicant's system necessary to introduce commercial service. This approach, as Ellipsat previously noted,

^{33/} See TRW Comments at 43.

has the advantage of accommodating different system designs and market strategies, including ELLIPSO™'s which is based on a progressive deployment strategy. Comments filed by other parties, including TRW and Constellation, share Ellipsat's view that the Little LEO standard is appropriate here and would similarly provide flexibility to allow the Big LEO service to evolve.^{34/}

Commercial service should be defined as the ability to provide 50% availability, i.e., continuous availability for 12 out of 24 hours including peak daytime hours. See Exhibit A. This standard offers a realistic and objective measure of commercial service. It has the added benefit of allowing each system to evolve in its own unique manner without penalizing particular market approaches or strategies.

In Ellipsat's view, a showing based on the portion of the system necessary to introduce commercial service is the most equitable approach and has been endorsed by a majority of the LEO applicants. However, there is support in the comments for adoption of the financial qualifications standard for RDSS licensees.^{35/} In addition, Ellipsat's proposal to use strict milestone schedules in lieu of financial qualification standards, i.e., require commercial service to be initiated within four

^{34/} See TRW Comments at 41-45.

^{35/} See Constellation Comments at 40-41.

years, would also be consistent with Commission precedent.^{36/}

Any of these approaches would, in fact, be more appropriate for a new service than the strict domsat standard.

The opening comments thus offer support for Ellipsat's position that a strict financial test is inappropriate in this proceeding given the fact that all of the Big LEO systems can be accommodated and the risk of an unqualified applicant foreclosing operation by other applicants is virtually non-existent. As a practical matter, an applicant that is unable to raise funding will not be able to proceed. The marketplace is therefore the best mechanism for determining which system or systems go forward. The Commission should not substitute its judgment with an artificial test that may prevent an applicant from providing service and, ultimately, from offering a diverse service option to the public. The LEO MSS applicants have widely disparate plans for providing service, and the final rule should be flexible in its implementation of the financial standards in order to allow different types of systems to evolve.^{37/}

C. If Irrevocability Is Required, All Applicants Should Be Held To The Same Standard

Ellipsat is troubled by the internally-inconsistent arguments of Motorola and Loral that, while urging adoption of a

^{36/} See Ellipsat Comments at 40.

^{37/} See Non Voice, Non-Geostationary Mobile-Satellite Service, 8 F.C.C. Rcd. 8450, 8451-52 (1993); Radiodetermination Satellite Service, 104 F.C.C.2d 650, 663-65 (1986).

strict financial showing, seek maximum flexibility by arguing that the current assets relied upon need not be committed to the project. Admittedly, there is a lack of clarity in the FCC case law and decisions. The Commission did state, however, in the 1985 domsat decision that applicants should be required to demonstrate "uncommitted current assets."^{38/} It is also well-established that evidence of commitment to the proposed satellite program by management is required where the applicant is owned by more than one corporate parent.^{39/}

The guiding principle in reconciling the precedent should be equitable treatment of the applicants. Motorola's argument heightens the concern, detailed in Ellipsat's opening comments, that the Commission will effectively adopt a double standard for companies with other lines of business (often large companies) and newly-formed companies (often small businesses). Although Ellipsat opposes the use of the domsat standard (unless modified along the lines of the NVNG MSS) if the Commission should allow companies with other lines of business to rely upon balance sheet tests, fairness dictates that those funds be irrevocably committed to the project. It is only fair for companies with other lines of business to be held to the same standard of

^{38/} Licensing Space Stations in the Domestic Fixed Satellite Service, 58 R.R.2d (P & F) 1267, 1269 (1985).

^{39/} Radiodetermination Satellite Service, 104 F.C.C.2d 650, 664 (1986).

irrevocability as companies that may rely on debt and equity funding, if a strict domsat standard is adopted.^{40/}

As noted in Ellipsat's opening comments (at pp. 43-44), a large balance sheet, without a commitment to move forward with the project, accompanied by an irrevocable commitment of funds, is certainly no guarantee that a company will proceed with system implementation. Indeed, in the 1985 domsat proceeding where the domsat standard was adopted, several large companies (with sizeable balance sheets) turned in their permits after a contentious licensing proceeding in which other applicants were dismissed as financially unqualified.

Nonetheless, to the extent that the Commission allows companies with other lines of business to rely upon a balance sheet test (without demonstrating that the funds are irrevocably committed to the project), the Commission should provide for equivalent treatment of newly-formed companies by allowing them to rely upon the balance sheets of their equity investors.

^{40/} Ironically, while insisting upon a strict domsat standard, Loral undercuts the rationale for this standard by arguing that: "the need for the funds to construct, launch and operate the systems will arise several years in the future; it is impractical and unnecessary to require applicants to earmark specific funds now for such expenditures." Loral Comments at 27. This reasoning is equally applicable to companies that plan to rely on debt and equity investments to fund their systems.

VIII. THE COMMENTS PROPOSE CRITICAL
REFINEMENTS IN THE SERVICE RULES

A. Common Carrier Regulation Is Inappropriate

The opening comments overwhelmingly share Ellipsat's view that MSS licensees should not be treated as common carriers to the extent that they may offer satellite capacity to CMRS providers. Presently, there is no legal compulsion for the MSS Above 1 GHz licensees to serve the public indifferently and there is no public interest reason for the FCC to impose such a requirement. As the comments properly point out, there will be a competitive environment including multiple competing Big LEO MSS space segment operators.

In addition, common carrier regulation could unnecessarily handicap this emerging industry. The Commission should allow the maximum flexibility for the LEO MSS service to develop and for licensees to determine the most optimal mode of operation. Similarly, licensees should have the flexibility to seek funding from a variety of sources, including foreign investment which could be inhibited by a common carrier designation.

B. Greater Flexibility Must Be
Provided for System Upgrades

The comments of other parties echo Ellipsat's concern that proposed Rule 25.143 (c) could inhibit system upgrades within the license term. Under that rule, replacement of technically

identical satellites is permitted without a separate application. Presumably, other replacements would be governed by the general rule with respect to license modifications (Rule 25.117).

Proposed Rule 25.143 (c) should be revised to permit greater flexibility to licensees. The public will benefit from the incorporation of technical advances into the LEO systems on an ongoing basis. One of the unique benefits of small satellites is that the shorter life-time and lower cost allows insertion of advanced technology more rapidly than is possible with conventional satellites that have longer construction lead times. The Commission should allow for this beneficial technology insertion by permitting the flexibility needed to incorporate new technology in replacement satellites.

On the other hand, Ellipsat believes that Motorola's request, to permit automatic replacement of "functionally equivalent" satellites is too broad. Indeed, any satellite capable of providing MSS could be considered "functionally equivalent." Nor would Motorola's standard provide adequate protection to operating systems.

Ellipsat therefore proposes that Rule 25.143 be modified to permit replacement satellites to be launched, without prior application, where the satellite does not increase the interference potential and has been properly coordinated. At a minimum, however, the Commission must provide greater flexibility

for system upgrades than would be permitted under the "technically identical" standard that is now proposed.

C. Implementation Milestones Should Accommodate Diverse System Approaches

1. The Commission Should Substitute Implementation of Commercial Service In Lieu of Construction Initiation

Ellipsat generally supported strict milestone schedules in its comments, but urged the Commission to ensure that the milestones accommodate diverse system approaches. In particular, Ellipsat recommended that the FCC adopt a requirement that commercial service be implemented within four years instead of requiring that construction of all satellites be initiated within three years.

Under the approach proposed in the Notice, construction of all satellites would need to be commenced within three years of grant and completed within six years. This approach could penalize systems like ELLIPSO™ which may be deployed in stages with attractive commercial service being offered at each stage. A requirement of commercial service implementation within four years is a definable and identifiable milestone, in contrast to other measures of progress.

Other comments have recommended that the Commission provide for greater flexibility in seeking modification of the milestone schedule. TRW, for example, seeks adoption of a rule providing

that the Commission will entertain reasonable requests for extensions of milestone deadlines.^{41/} While Ellipsat shares TRW's view that flexibility is desirable (in Ellipsat's case to accommodate its deployment strategy), this can be accomplished more effectively by adoption of Ellipsat's proposal to substitute the four-year commercial service milestone in lieu of, or as an alternate for, the construction completion milestone.

2. The Commission Should Reject Motorola's Proposed Ground Infrastructure Milestone

The FCC should flatly reject Motorola's proposed milestone which would require licensees to establish ground segment infrastructure in countries representing 75% of the world's population within six years. This milestone proposal represents a transparent attempt by Motorola to penalize systems using gateways and ground-based switching (in contrast to Motorola's inter-satellite links). It is designed to deny to other systems cost-efficiencies which Motorola has failed to introduce into its own.

Licensees should have the discretion and flexibility to provide service which responds to market demand. A ground infrastructure requirement would potentially mandate artificial and burdensome requirements that have no relation to market needs. Moreover, the ground segment will be subject to the

^{41/} See TRW Comments at 175-77.

licensing and regulatory scheme of the countries where operation is proposed and is therefore beyond the licensee's control.

D. The Commission Should Not Mandate Specific
Obligations Relating to Non-Profit Entities

The Commission should not require licensees to offer a specific percentage of in-orbit system capacity to non-profit organizations. This type of requirement is not appropriate and could impose an onerous financial burden on the MSS systems.

Although several public broadcasting organizations have expressed interest in access without charge or at preferential rates, Ellipsat notes that the proposed mobile satellite systems are not well-suited to provide the kinds of services desired by these public broadcasting organizations. MSS systems are inherently low data rate services. Such systems cannot supply the high bandwidth required to support the kinds of educational services envisioned by public broadcasters without drastically absorbing overall MSS capacity. These type of high data rate services are more efficiently provided by geostationary satellite systems or terrestrial facilities.

XI. CONCLUSION

Ellipsat urges the Commission to act expeditiously to adopt rules and policies for the MSS Above 1 GHz Service in accordance

with the views expressed herein and in its previously filed
comments.

Respectfully submitted,

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Exhibit A

0071:412JAS.94

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CHANGES TO PROPOSED RULE 25.143

1. A new Section 25.143 is added to read as follows:

§ 25.143 Licensing provisions for the 1.6/2.4 GHz
Mobile-Satellite Service.

(a) System License: Applicants authorized to construct and launch a system of technically identical non-geostationary satellite orbit satellites will be awarded a single "blanket" license covering a specified number of space stations.

(b) Qualification Requirements.

(1) General Requirements: Each application for a space station system authorization in the 1.6/2.4 GHz mobile-satellite service shall describe in detail the proposed satellite system, setting forth all pertinent technical and operational aspects of the system, and the technical, legal, and financial qualifications of the applicant. In particular, each application shall include the information specified in § 25.114.

(2) Technical Qualifications: In addition to providing the information specified in (b)(1), each applicant shall demonstrate the following:

(i) that the proposed system employs a non-geostationary constellation or constellations of satellites;

(ii) that the proposed system is capable of providing mobile satellite services to all areas of the world, with the exception of the polar regions, at least 75% of every 24-hour period, i.e., that at least one satellite will be visible above the horizon at an elevation angle of at least 15° 5' for at least 18 hours each day between 55° southern latitude and 75° northern latitudes;

(iii) that the proposed system is capable of providing voice service on a continuous basis throughout the U.S., i.e., that at least one satellite will be visible above the horizon at an elevation angle of at least 25° 5'-at any point within the United States at all times;

(iv) that operations will not cause unacceptable interference to other authorized users of the spectrum. In particular, each application shall

demonstrate that the space station(s) comply with the requirements specified in § 25.213.

(3) Financial Qualifications: Each applicant for a space station system authorization in the 1.6/2.4 GHz mobile-satellite service must demonstrate, on the basis of the documentation contained in its application, that it is financially qualified to proceed expeditiously with meet-the-estimated-costs-of-the-construction, and launch and operation of all proposed space stations in the system and the estimated operating expenses for one year of the satellites needed to provide 50% commercial service to the United States, i.e., at least 12 hours continuous voice services which includes the daytime hours of 8 a.m. to 6 p.m. ~~after-the-launch-of-the initial-space-station.~~ Financial qualifications must be demonstrated in the form specified in §§ 25.140(c) and (d). Failure to make such a showing will result in the dismissal of the application.

(c) Replacement of Space Stations within the System License Term. Licensees of non-geostationary 1.6/2.4 GHz mobile-satellite systems authorized through a blanket license pursuant to paragraph (a) of this section need not file separate applications to construct, launch and operate (i) technically identical replacement satellites within the term of the system authorization; or (ii) replacement satellites that do not create any new or increased interference. However, the licensee shall certify to the commission, at least thirty days prior to launch of such replacement(s) that:

(1) the licensee intends to launch a space station that is (a) technically identical to those authorized in its system authorization or (b) does not create any new or increased interference, and

(2) launch of this space station will not cause the licensee to exceed the total number of operating space stations authorized by the Commission.

(d) In-Orbit Spares. Licensees need not file separate applications to operate technically identical in-orbit spares authorized as part of the blanket license pursuant to paragraph (a) of this section. However, the licensee shall certify to the Commission, within 10 days of bringing the in-orbit spare into operation, that operation of this space station did not cause the licensee to exceed the total number of operating space stations authorized by the Commission.



EXHIBIT B